PLACOBDELLA PEDICULATA n. sp.[1]

ERNEST E. HEMINGWAY
UNIVERSITY OF MINNESOTA

IN the summer of 1889, while at Lake Pepin superintending the zoological work of the Geological and Natural History Survey of Minnesota, Professor Nachtrieb found that some of the sheepsheads (*Aplodinotus grunniens*) which were being seined from the lake in large numbers by the local fishermen had a large parasitic leech fastened to the isthmus or shoulder under the gill cover. Three of these leeches were collected at that time, with portions of the fish showing the place and manner of attachment. One of these specimens was later sent to Professor J. Percy Moore, who found it to be a new species of *Placobdella* and suggested the specific name *pediculata*. All the specimens originally collected were adults, gorged with blood, and greatly modified in form from the usual *Placobdella* types by their close parasitic habit; so that, in some parts, annulation and many other external features had been entirely obliterated. It was seen at once that to determine these features younger and better-preserved specimens must be obtained. Accordingly, during the first part of September, 1903, I spent several days with the fishermen around the head of Lake Pepin examining fish for this leech. During this time I examined many hundreds of fish and succeeded in obtaining three small specimens, none of which were over a centimeter in length.

HABITS

Placobdella pediculata appears to be a true fish parasite, having been found only in the gill chamber of the

[1] From the laboratory of the Department of Animal Biology, the University of Minnesota.

fresh-water sheepshead, the posterior sucker of the leech being deeply imbedded in the side of the isthmus or shoulder. In the case of young leeches which have not been long attached, the depression caused by the posterior sucker is comparatively shallow, being a mere external depression in the inflamed tissues of the fish. As the attachment continues the inflamed tissues of the host grow up like a collar and close in around the leeches body in front of the sucker. This closing in of the inflamed collar presses upon the body of the leech, narrows it to a slender peduncle in front of the sucker and in-

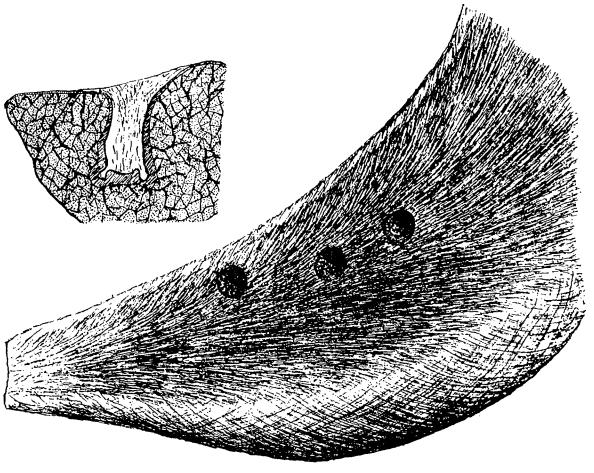

FIG. 1. The shoulder of a sheepshead with three depressions from which the leeches have been removed and one of the depressions cut in two lengthwise.

cidentally crowds the sucker down into the tissues of the fish, so that, in time, this depression may reach into the underlying muscles to a depth of half an inch or more and have an opening of about a quarter (or less) of an inch in diameter. The bottom of the depression has a larger diameter. Fig. 1 represents the positions of three depressions from which the leeches have been removed, and one of the depressions cut in two lengthwise.

These leeches are capable of becoming greatly contracted, and when one is disturbed it draws back until it appears as a mere brownish pyriform knob which entirely covers the place of attachment.

The burying of the posterior segments in the tissues of the host has brought about an interesting structural change so that we find the anal opening shifted forward to a position between somites XXIII and XXIV instead of between somites XXVII and XXVIII, as in the other members of the genus. It is noticeable that, while the young leeches whose posterior portions are not yet deeply imbedded have the characteristic position of the anus (XXIII–XXIV), the outline of the posterior part of the body is still a regular curve showing none of the pedicular characteristics so pronounced in the older individuals. The posterior sucker, however, is very strongly developed even in those not more than a centimeter long.

Practically nothing is known of this leech separate from its host, but it seems possible that a part of its existence may be spent elsewhere. During September, 1903, I examined several thousand fish of this species from Lake Pepin and found only three isolated leeches, each about a centimeter in length. The posterior sucker, while imbedded in the tissue, was not sunk in deeply and so had not produced the characteristic peduncle. They were evidently young ones which had recently attached themselves to their hosts and were gradually sinking the posterior sucker into the host's flesh. As full grown specimens, deeply imbedded, were found in the same locality during August of 1899, at least some of the adults must remain with their hosts during the summer and probably throughout the year.

Description[2]

Like *Placobdella parasitica* and *P. rugosa*, this is a species of large size, though not quite equaling the largest

[2] This description is based upon both young and large mature specimens gorged with blood. In view of unavoidable delay in the publication of Professor Nachtrieb's projected report on the leeches of Minnesota, Professor Moore kindly consented to the free use of his description prepared for the systematic portion of the report here alluded to. I have retained the specific name suggested by Moore, though his description, being based upon a single large, gorged and much contracted specimen, was of necessity somewhat incomplete.

examples of the forms mentioned. It is more than usually contractile and therefore difficult to preserve in a suitable condition for study. The outline is very characteristically pyriform and strongly convex dorsally, as shown in the figures. But the most striking peculiarity is the attenuation of the posterior somites to form a narrow pedicel just in front of the posterior sucker, which consequently stands out freely in a most characteristic manner. The oral sucker has the same structure as in *P. parasitica*.

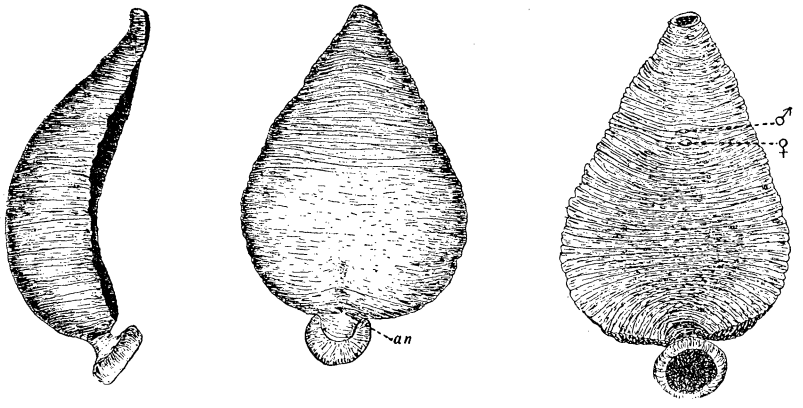

FIG. 2. Lateral, dorsal and ventral views of a mature specimen gorged with blood.

No trace of cutaneous papillæ can be detected, the skin being perfectly smooth. The segmental sensillæ and scattered sense organs are very indistinct. Eyes are very difficult to detect in the mature animals, but appear as small pigment masses at III–IV in the young. The annulation is essentially like that of *P. parasitica* excepting the caudal peduncle and the generally simpler structure of the corresponding somites of *P. parasitica*.

Somites I and II contain each but one annulus. Somites III and IV are biannulate and V is biannulate dorsally, but ventrally the furrow fades away medially. VI is triannulate above, but the furrow a1–a2 is incomplete below. Somites VII to XXIV are triannulate, but

the furrow a1–a2 is incomplete medially on the ventral side of both VII and VIII, and in most of the succeeding sonites is less marked than either a2–a3 or the intersegmental furrows. In the anterior somites and to a less degree in the posterior, a3 is slightly longer than a1 or a2. The annulation of the post-anal somites, constituting the caudal peduncle, is irregular and somewhat puzzling on the older specimens, but is fairly distinct on the younger ones. Somite XXIV, which immediately succeeds the anus, is triannulate. Somites XXV, XXVI and XXVII are all biannulate, but a1 of somite XXV is partially divided and a1 of both XXVI and XXVII is

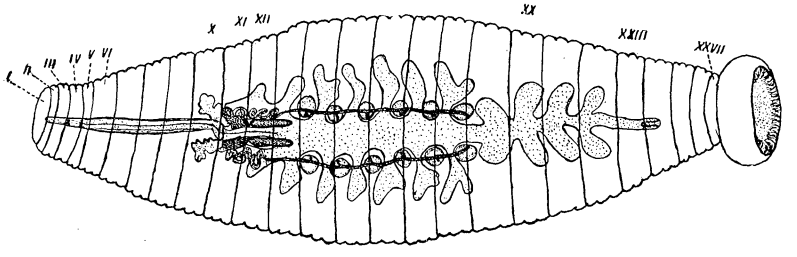

FIG. 3. Sketch of a young specimen showing somites I–XXVII, annuli and relative positions of the eye (*e*), proboscis (*prob*), esophageal gland (*oeg*), enlarged portion of the vas deferens communis (*s*), ovary (*ov*), testes (*T*), vas deferens communis (*vdc*), intestine (*int*) and anus (*an*).

larger than a2. Neither annulus of XXVII is complete, a1 reaching only to the sides of the body and a2 not as far. The disc is composed of somites XXVIII to XXXIV. The accompanying Fig. 3 represents the arrangement of the furrows in a young animal. Somite XXIV is the last segment of the body proper and its posterior boundary forms in contracted specimens a fold which envelops the contiguous portion of the narrowed peduncle. The latter continues to narrow to the sucker, to the middle portion of which it is strongly attached for rather more than the posterior half. The posterior sucker is larger, circular and directed strongly ventrad. The nephridiopores are in the sensory annuli of somites VIII to XI and XIII to XXIII and are placed similarly to those of *P. parasitica*.

The mouth is very small and situated far forward near the anterior rim of the sucker in somite II. As in related species, the proboscis is slender and the crop is provided with seven pairs of large cæca reaching nearly to the margins of the body. The cæca, however, are less deeply and finely divided than in *P. parasitica,* each of the first six pairs exhibiting only two or three rather short lobes. The intestine reaches to the posterior part of somite XXIV or even beyond and then bends abruptly forward toward the dorsum as an extremely narrow rectum reaching to the minute anus situated at XXIII–XXIV. The forward curvature of the rectum and the anterior position of the anus are unique features in the family. The salivary glands are widely scattered through the anterior two thirds of the body. On either side of the esophagus in somites X and XI lie a pair of compact esophageal glands which join the esophagus by a short duct in somite XI.

The reproductive organs are essentially similar to those of *P. parasitica.* The male and female external orifices are situated at XI–XII and XIIa2–a3, respectively. Six pairs of testes are crowded between the bases of the gastric cæca. The large sperm sack and the ejaculatory duct of the vas deferens form a compact snarl in somite XII in the immediate neighborhood of the atrium. Nothing is known of the early stages of development.